US-MMC/UK-JNCC Workshop "Policy on Sound and Marine Mammals", 28-30 September – London

# Comments from the German Federal Agency for Nature Conservation (BfN) on SCAR Information Paper 078 (CEP VII)

(SCAR Report on Marine Acoustic Technology and the Antarctic Environment)

The comments below have been sent to SCAR by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) in response to Information Paper 078 from SCAR, which was circulated too late for respective reaction within the meeting of the Committee on Environmental Protection (CEP VII, 24-28 May 2004) of this year's Antarctic Treaty Consultative Meeting (XXVII ATCM).

The original quotations from SCAR-IP 078 (2004) are cited in *italics* while original scientific and technical comments from BfN follow subsequent below (with some minor recent adjustments). Furthermore, there are some new addendums (from BfN) in capital letters in this paper which reflect policy issues according to this meeting's agenda.

Some selected paragraphs of the "Protocol on Environmental Protection to the Antarctic Treaty (1991)" with regard to "taking" of and "harmful interference" with marine mammals and the protection of endangered, threatened, or specially protected species in the Antarctic and a list of "Endangered, Threatened, or Specially Protected Marine Mammals of the Antarctic (south of 60°S)" are given as an appendix to this document. Those relevant provisions of the "Environmental Protocol" and related information might be regarded as a supplement to the presentation on the "Antarctic case study" on 28 September 2004 (D. Walton/SCAR).

### General comment:

It is welcomed that previous comments made by Germany to previous SCAR-(IP & WP) papers for the CEP will be reflected in the final report (SCAR-IP 078, p. 4, point 16) and that this SCAR-IP 078 is already much more differentiated than its predecessor SCAR-IP 24 (and -WP 23) from CEP V/Warszawa.

Some additional scientific information on the topics discussed is given hereby to give SCAR the possibility of producing a balanced paper including supplementary information. SCAR is asked to reflect the respective comments for amendment of the final publication and future paper for CEP VIII.

Ad 1. "The sea is a naturally noisy environment but the environmental effects of noise generated specifically by human activities in the ocean have generated considerable concern in some circles."

as well as ad Annex II, p. 8 first para/Figure R-1:

"The marine environment is an inherently noisy place with a wide variety of processes contributing both to the ambient, background noise (that may resemble traffic noise in a large city) to high intensity sounds such as lightening strikes or earthquakes (Fig. R-1). Biological noise input can also be quite high with fish choruses, snapping shrimps and marine mammals capable of producing noise that interferes with scientific instruments."

As an addendum to the phrases above some more information is given below:

Adding to more or less constant low frequency noise from growing ship traffic as well as to temporary intense sound emissions from navies, geophysical surveys and construction work, oceanographic science is developing a world-wide net of moored transmitters (e.g. NPAL, RAFOS, PIES) in the meantime sounding <u>all</u> oceans. Thus, low frequency ambient noise is nowadays about 10-20 dB re. 1 µPa higher in the oceans of the more industrialised northern hemisphere than in the southern hemisphere (MILLER 2003). Low frequency ambient noise has increased up to 5.5 dB re. 1 µPa per decade in some regions of the northern hemisphere during the second half of the last century which depicts nearly a doubling of the ambient sound pressure level in every ten years with regard to the logarithmic dB-scale (URICK 1983; ANDREW et al. 2002; McCarthy & MILLER 2002; OCEAN STUDIES BOARD 2003; MILLER 2003; NMFS 2004).

In this context it should be mentioned that generalized ambient ocean noise is ranging from a maximum of 140 dB re 1  $\mu$ Pa²/Hz at 1 Hz to a maximum of only ~60 dB re 1  $\mu$ Pa²/Hz at 10 kHz according to WENZ (1962). According to SCAR-IP 078 Figure R-1 generalized ambient ocean noise is even lower. In the context of the Southern Ocean it is worth to mention that in addition sea ice can produce some noise (citations in RICHARDSON et al. 1995, p. 93). However these sound pressures are negligible in the relevant spectra. Any higher sound pressures of natural character are geographically and temporally limited (e.g. lightning strikes, earth quakes). Therefore the marine environment is not "inherently noisy" per se, but natural noise above ambient sound pressure levels occurs under limited spatio-temporal circumstances.

One example is given here to illustrate the horizontal scope of anthropogenic low-frequency noise pollution from geophysical seismic airgun surveys: Depending on the season >75 % up to 100% of the recordings of autonomous acoustic seafloor recording systems of the U.S.-NOAA on the central mid-Atlantic Ridge were dominated in the past years by low frequency airgun noise (seismic) from geophysical surveys often >3000 nautical miles away off northeast-Brazil, northwest-Africa, and east-Canada masking other sound targets (PMEL-NOAA 2001; NIEUKIRK et al. 2003; NIEUKIRK et al. 2004).

Regarding this perspective it is remarkable that a nominal sound pressure source level of 250 dB from a powerful airgun-array is about one thousand times the sound pressure level of the ambient noise in respective low frequencies ( $\sim$ 50-100 Hz  $\rightarrow$  <90 dB according to WENZ 1962). However, exact measurements of sound pressure source levels and spreading loss are missing for nearly all hydro-acoustic research instruments and oceanographic situations in the Southern Ocean. For these problems, SCAR could enhance respective research proposals.

Snapping shrimps and those fish species presumably indicated, which produce sounds of higher levels in choruses, do not occur in the Antarctic/Southern Ocean but in shallow (coastal) tropical to temperate seas. Above that, it is a rather anthropocentric point of view to complain about sounds from animals that might interfere with the performance of scientific acoustic instruments under some special circumstances. As a supplement to this respective phrase one should know that the fact that some animals are able to produce loud sounds as loud as technical devices does not necessarily imply that loud sounds from technical devices could not do any harm to marine mammals. Differentiated views on this issue have been presented by MØHL (2004), focussing on questions of protection from self-generated sounds due to technical differences between sounds from animal *versus* sounds from sonar or by KETTEN (1997, 2001, 2002) focussing on physiological patterns of protection from self-generated sounds.

In contrast to the seismic airgun level indicated in Figure R-1 with a maximum of ~225-230 dB seismic airgun arrays can reach up to 256 dB which is again more then a ten times higher sound pressure level (or a hundred times higher intensity) with respect to the logarithmic dB-scale. Deep-water multibeam echosounders frequently used for bathymetric surveys in Antarctica are not indicated in this figure. They can also have a sound pressure source level as high as a nominal 239 dB re 1  $\mu Pa@1m$ . Such additional information could be given by SCAR to extend the information of Figure R-1.

The topics discussed above, and especially the character of the Southern Ocean being still a "low-intensity sound region", a circumstance probably of importance for migrating whales and for resident marine organisms, should be reflected by SCAR with regard to all statements on temporary (ship-based) surveys and longer lasting oceanographic experiments and with additional regard to the fact that stationary RAFOS and PIES sound sources are already moored in the Southern Ocean.

### Additional new addendum (by BfN) to the previous comments with respect to policy aspects:

THE RESPECTIVE CONCLUSION SHOULD BE ACCORDING TO THE SPIRIT OF THE ANTARCTIC TREATY, THE ENVIRONMENTAL PROTOCOL AND ITS PROVISIONS:

"AT LEAST THE SOUTHERN OCEAN SHOULD REMAIN THE LAST REGION ON EARTH WERE OCEAN NOISE POLLUTION SHOULD BE KEPT TO A MINIMUM TO PROVIDE A "LOW-INTENSITY SOUND REFUGE" FOR MIGRATING WHALES AS WELL AS FOR RESIDENT MARINE ORGANISMS."

\_\_\_\_\_\_

Ad 6. "... It is now possible to decide whether a sound pressure level and duration of the sound has the potential to cause hearing loss in a cetacean. This means that it is now possible to say how close and for how long an animal needs to be to a particular piece of equipment of known output to experience hearing damage."

This statement should be made more precise. According to KETTEN (2001, 2002) sensitivities can be *i.a.* species-, season-, age-, and gender-dependent. The statement

above refers to some trials of some individuals of only three non-Antarctic species (Bottlenose dolphin, Beluga whale, False killer whale) who had been in captivity for a long time and who have been used for a wide range of scientific tests for many years. Therefore the 1:1 transfer of results to a whole species or even to other species of odontocetes is only approximately possible. Nothing is known about acoustic sensitivities and trauma in baleen whales. Acoustic sensitivities in baleen whales can only be estimated by functional models taking into account the anatomy of the basilar hearing membrane of the cochlea (KETTEN 1997, 2002).

However, the curve of the -3 dB-exchange rate (IP 078, Annex I) can be used as an approximation for risk assessments under reflection of some remaining uncertainties. New scientific knowledge can provide further assistance in evaluating whether duration and sound pressure level of a sound exposure has the potential to cause hearing loss in a marine mammal.

\_\_\_\_\_\_

Ad 8./Annex I p7 fifth para: "... as resulting from high stress producing disorientation, panic and internal bleeding that would be reversible if the animals did not strand." Internal bleedings (subarachnoidal, intracochlear duct, intra-acoustic fat, intra-kidney and intra-eye haemorrhages, some even being partly massive) as described i.a. by DEGOLLADA et al. 2003, Martín et al. 2004, Fernández 2004, Frantzis 2004, Freitas 2004, Rowles 2004, plus fat and gas embolism are most likely not compatible with reversibility to a healthy status of (deep diving) animals. This statement concerning "reversibility" reflects the problem of public interpretation of results from acoustic impacts research by stakeholders. However, conversely the US-Navy's own report admitted that the lesions mentioned above were associated to a high probability with the perception of intense acoustic signals, that "it is not known what effects these pathologies would have on survival in deep diving animals", and that "the effects of subarachnoid hemorrhage and intracochlear blood in deep diving mammals ... may be more profound than in terrestrial mammals" (NOAA & US NAVY 2001, pp. ii, 16, 47). To give a more balanced view on this topic SCAR should insert some words in the final SCAR report, that there are also sceptical opinions (i.a. also at the "2004 Beaked Whale Workshop") regarding the "reversibility" of such injuries or of following secondary effects to a healthy status.

### Ad 10./Annex II risk matrices:

Sensitivity for intense acoustic imissions is *a priory* species-dependent and above that depending on sensitive seasons, habitats as well as on local oceanography (i.a. sound propagation characteristics) and is above that depending on a series of technical parameters related to the instruments applied. Therefore such matrices are a good starting point for an environmental impact evaluation but additional considerations regarding e.g. instrument, species, seasonal, and oceanographic parameters and consequences of behavioural reactions should be taken into account as appropriate.

\_\_\_\_\_\_

Ad 14. "These measures should be modified to take into account developments in methods of monitoring the presence of marine mammals and increased knowledge of the distribution of animals in the Antarctic."

Ad 15. "To mitigate against unknown, long term, cumulative effects, the conclusion of the first workshop that higher risk surveys should not revisit areas in consecutive seasons was also supported."

These two points (14. & 15.) are highly welcomed as they reflect the necessary precaution in this issue.

-----

Ad 17. "... The Action Group was pleased that the Berlin workshop reached similar conclusions to the original SCAR ad hoc group. This suggests that a consensus is growing among the experts in the field."

Looking at the conveners of the Berlin- and the first Cambridge-workshop one could get the impression that these meetings had been organized by stakeholders for the use of hydro-acoustic research instruments. The list of participants reveals that there were only ~6 well-known experts in the field of active acoustic impact research out of ~41 participants at the Berlin-workshop. At the first Cambridge-workshop the relation was 2 well-known experts in the field of active acoustic impact research out of 16 participants. Thus, cetacean-bioacousticians, marine mammal impact research-biologists, or experts for visual/acoustic presence and behavioural cetacean research were clearly underrepresented in these two meetings. Bearing this in mind, more experts in the fields of impact research and mitigation should be invited for future similar workshops on this issue to avoid any impression that conclusions in the respective reports could have been achieved in an unbalanced way.

For example, stakeholders doing the "impact research" their selves have already led to growing concern within the scientific community and NGOs (Rose 2001, 2003; Weilgart 2002, 2003; ECS 2003; Reynolds 2003; Rossiter 2003; Whitehead 2003a, 2003b) with regard to impact research organised and financed by the U.S. Office of Naval Research/ONR (see contributions to ECOUS 2003).

In contrast, in a recent symposium (28 June – 03 July 2004) conducted by the Subcommittee on Environmental Concerns of the International Whaling Commission (IWC) severe concerns were expressed regarding

- a) powerful sound sources as seismic airguns and Navy sonars. Such devices were regarded to likely be able to cause lethal implications for whales in acute exposures (beaked whales from military MF-sonar, mysticetes and beaked whales from geophysical seismic exploration surveys);
- b) chronic exposures to lower sound levels causing *i.a.* impacts on whale communication abilities and behaviour, exclusion from critical habitats, and habitat degradation.

During the symposium presentations on

- effects of anthropogenic noise on marine animals and the possible synergistic effects between ambient ocean noise levels and other environmental stressors,
- physical acoustics and ambient noise in the ocean,
- audition and the physiology of hearing in cetaceans and the effects of intense sound on cetacean hearing, and
- whale communication behaviour

were given and new examples and evidence were presented to illustrate such impacts from anthropogenic sound sources (e.g. SC56/E13; SC56/E28; SC56/E37; SC56/E38). The scientific findings of the symposium lead to a wide range of recommendations from the Scientific Committee to the Commission of the IWC.

\_\_\_\_\_\_

Ad 19. "... Furthermore, protection of high seas areas within the Southern Ocean is a responsibility with CCAMLR."

THE QUESTION OF DEMARCATION BETWEEN CCAMLR AND MARINE ASPECTS OF THE ENVIRONMENTAL PROTOCOL IN THEIR COMPLEXITY ARE REPEATEDLY DISCUSSED OR QUESTIONED IN SCIENTIFIC PUBLICATIONS ON INTERNATIONAL LAW (e.g. HERR 2000) AS WELL AS REGULARLY EMERGING AT THE CEP/ATCM. THEREFORE, NO SUCH SINGLE SIMPLE STATEMENT REFLECTS THE REALITY. IN ADDITION THE IWC IS GRANTED FURTHER RESPONSIBILITY FOR WHALES IN ARTICLE 7 OF ANNEX II OF THE ENVIRONMENTAL PROTOCOL TO THE ANTARCTIC TREATY. THIS MIGHT BE OF IMPORTANCE REGARDING THE IWC/SC RECOMMENDATIONS INDICATED ABOVE.

.....

### Ad Annex I

### p.7 second para:

Such observations refer to animals at or close to the surface in the vicinity of acoustic devices. However, such animal behaviour can also be explained by "sound-shadowing" and the "Lloyd-mirror effect". There is a scientific knowledge gap of how these animals would behave when they would get into the main beam of the sound.

\_\_\_\_\_\_

### Ad Annex II

p. 8 last para: "Because the process looked at generalized activities, risks might increase for biological "hot spots", narrow seaways, or features like ice-cover that probably in some circumstances might change sound propagation characteristics as well as risks related to "panic reactions".

.....

### **REFERENCES**

- ANDREW, R.K.; HOWE, B.M.; MERCER, J.A. & DZIECIUCH, M.A. 2002: Ocean ambient sound: Comparing the 1960s with the 1990 for a receiver off the California coast. Acoustics Research Letters Online 3(2): 65-70. <a href="http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=ARLOFJ000003000002">http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=ARLOFJ000003000002</a> 000065000001&idtype=cvips&gifs=Yes
- DEGOLLADA, E.; ARBELLO, M.; ANDRÉ, M.; BLANCO, A. & FERNÁNDEZ, A. 2003: *Preliminary ear analysis report of the 2002 Canary Islands Ziphius mass stranding.* European Cetacean Society 17<sup>th</sup> Annual Conference, abstracts pp. 60-61.
- ECS/COUNCIL OF THE EUROPEAN CETACEAN SOCIETY 2003: European Cetacean Society Statement on Marine Mammals and Sound. <a href="http://www.broekemaweb.nl/ecs/ecs-sound-statement.htm">http://www.broekemaweb.nl/ecs/ecs-sound-statement.htm</a>
- ECOUS 2003: Symposium "Environmental Consequences of Underwater Sound (ECOUS)", San Antonio, Texas 12-16 May 2003, U.S. Office of Naval Research-ONR, Science and Technology, Human Systems. http://www.onr.navy.mil/sci%5Ftech/personnel/341/ecous/default.asp
- EVANS, P.G.H. & MILLER, L.A. 2004 (Eds.): *Proceedings of the workshop on Active Sonar and Cetaceans.* ECS Newsletter NO. 42 Special Issue FEB 2004.
- FERNÁNDEZ, A. 2004: Pathological findings in stranded beaked whales during the naval military manoeuvres near the Canary Islands. pp. 37-40 in: EVANS, P.G.H. & MILLER, L.A. (eds.): European Cetacean Society 17<sup>th</sup> Annual Conference. Proceedings of the workshop on Active Sonar and Cetaceans. Las Palmas, 8.03.2003. ECS Newsletter No. 42 Special Issue Feb. 2004.
- FRANTZIS, A. 2004: The first mass stranding that was associated with the use of active sonar (Kyparissiakos Gulf, Greece, 1996). pp. 14-20 in: EVANS, P.G.H. & MILLER, L.A. (eds.): European Cetacean Society 17<sup>th</sup> Annual Conference. Proceedings of the workshop on Active Sonar and Cetaceans. Las Palmas, 8.03.2003. ECS Newsletter No. 42 Special Issue Feb. 2004
- FREITAS, L. 2004: The stranding of three Cuvier's Beaked Whales Ziphius cavirostris in Madeira Archipelago May 2000. pp. 28-32 in: EVANS, P.G.H. & MILLER, L.A. (eds.): European Cetacean Society 17<sup>th</sup> Annual Conference. Proceedings of the workshop on Active Sonar and Cetaceans. Las Palmas, 8.03.2003. ECS Newsletter No. 42 Special Issue Feb. 2004.
- HERR, R.A. 2000: *CCAMLR* and the Environmental Protocol: Relationships and Interactions. pp. 273-284 <u>in</u>: VIDAS, D. (Ed.): *Implementing the Environmental Protection Regime for the Antarctic.* Kluwer Academic Publishers, NL.
- KETTEN, D.R., 1997: Structure and function in whale ears. Bioacoustics, 8,103-137.
- KETTEN, D.R., 2001: *Presentation on "Aging, injury, disease, and noise in marine mammal ears"*. Acoustical Society of America 142nd Meeting, 6 December 2001. Journal of the Acoustical Society of America, Vol. 110, No. 5, Pt. 2, p. 2721.
- KETTEN, D.R., 2002: Presentation on "Physical Effects/Physical Damage on Marine Mammals". Workshop on Offshore Windmills Sound Emissions and Marine Mammals. FTZ-Büsum, 15.01.2002.
- MARTÍN, V.; SERVIDIO, A. & GARCÍA, S. 2004: *Mass strandings of Beaked Whales in the Canary Islands*. pp. 33-36 <u>in</u>: EVANS, P.G.H. & MILLER, L.A. (eds.): European Cetacean Society 17<sup>th</sup> Annual Conference. Proceedings of the workshop on Active Sonar and Cetaceans. Las Palmas, 8.03.2003. ECS Newsletter No. 42 Special Issue Feb. 2004.
- MCCARTHY, E. & MILLER, J.H. 2002: *Is anthropogenic sound in the ocean increasing?* Journal of the Acoustical Society of America 112(5):2262.
- MILLER, J.H. 2003: *Physics of Sound in the Sea.* Panel discussion "The Science Behind Noise and Marine Mammals: An update and discussion of the issues". 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Greensboro N.C. USA, December 14-19, 2003.
- MØHL, B. 2004: Sperm whale sonar rivals tactical sonar with source levels at 235 dB. pp. 41-42 <u>in</u>: EVANS, P.G.H. & MILLER, L.A. (Eds.): Proceedings of the workshop on Active Sonar and Cetaceans. ECS Newsletter NO. 42 Special Issue FEB 2004.
- NIEUKIRK, S.L.; MELLINGER, D.K.; HEIMLICH, S.L.; DZIAK, R.P.; HAXEL, J.H.; LAU, T.K.A.; & FOX, C.G. 2003: Seismic airgun sounds recorded on moored hydrophones in the Mid-Atlantic and

- eastern tropical Pacific Oceans. 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Greensboro N.C. USA, December 14-19, 2003.
- NIEUKIRK, S.L.; STAFFORD, K.M.; MELLINGER, D.K.; DZIAK, R.P. & FOX, C.G. 2004: Low-frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean. Journal of the Acoustical Society of America 115 (4): 1832-1843 (April 2004).
- NMFS/National Marine Fisheries Service 2004: Shipping noise workshop. <a href="http://www.shippingnoiseandmarinemammals.com">http://www.shippingnoiseandmarinemammals.com</a>
- NOAA & US-NAVY 2001:
- Joint interim report Bahamas marine mammals stranding event of 15-16 March 2000. U.S. Department of Commerce, NOAA, NMFS, US-Navy. <a href="http://www.nmfs.noaa.gov/prot\_res/overview/Interim\_Bahamas\_Report.pdf">http://www.nmfs.noaa.gov/prot\_res/overview/Interim\_Bahamas\_Report.pdf</a>
- OCEAN STUDIES BOARD OSB 2003: *Ocean Noise and Marine Mammals*. National Academies Press, Washington D.C. 192 pp.
- PMEL-NOAA (Pacific Marine Environmental Laboratory National Oceanic & Atmospheric Administration) 2001: <a href="http://www.pmel.noaa.gov/vents/acoustics/env-noise/airguns.html">http://www.pmel.noaa.gov/vents/acoustics/env-noise/airguns.html</a>; <a href="http://oceanexplorer.noaa.gov/explorations/sound01/background/seasounds/seasounds.html">http://oceanexplorer.noaa.gov/explorations/sound01/background/seasounds/seasounds.html</a> #Anchor-1515
- REYNOLDS, J. 2003: Panel discussion "The Science Behind Noise and Marine Mammals: An update and discussion of the issues". 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Greensboro N.C. USA, December 14-19, 2003.
- RICHARDSON, W.J.; MALME, C.I. & GREEN, C.R.jr. 1995: *Marine Mammals and Noise*. Academic Press.
- ROSE, N. 2001: Interpreting research results: Government regulation of anthropogenic noise sources. Journal of the Acoustical Society of America, November 2001, Volume 110, No. 5, Pt. 2 of 2, p. 2714. http://files.hsus.org/web-files/PDF/ASA presentation.pdf
- ROSE, N. 2003: Panel discussion "The Science Behind Noise and Marine Mammals: An update and discussion of the issues". 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Greensboro N.C. USA, December 14-19, 2003.
- ROSSITER, W. 2003: *Sonar Kills Whales, So What?* Cetacean Society International, Whales Alive! Vol. XII No. 3, July 2003. <a href="http://csiwhalesalive.org/csi03303.html">http://csiwhalesalive.org/csi03303.html</a>
- ROWLES, T. 2003: *Presentation on "Atypical mass stranding incidents Bahamas case"*. European Cetacean Society 17<sup>th</sup> Annual Conference. Workshop on Active Sonar and Cetaceans. Las Palmas, Gran Canaria, 8.03.2003.
- URICK, R.J. 1983: Principles of Underwater Sound, 3rd ed. New York: McGraw-Hill.
- WEILGART, L. 2002: The threat of underwater noise on whales: management in light of scientific limitations. Conference of Impact of Acoustics on Marine Organisms. Berlin, 17-19 June 2002
- WEILGART, L. 2003: *LFA Sonar and Marine Mammals: Scientific Limitations, Credibility, and Management.* European Cetacean Society (ECS) 17<sup>th</sup> Annual Conference, Gran Canaria, 9-13 March 2003.
- WENZ, G.M. 1962: Acoustic ambient noise in the ocean: Spectra and sources. Journal of the Acoustical Society of America 34(12): 1936-1956. Curve replotted with presently used units in RICHARDSON et al. 1995.
- WHITEHEAD, H. 2003 a: Learning from the LFA fiasco: Whither the credibility of marine mammal bioacoustics? Symposium "Environmental Consequences of Underwater Sound (ECOUS)", San Antonio, Texas 12-16 May 2003.
- WHITEHEAD, H. 2003 b: *Panel discussion "The Science Behind Noise and Marine Mammals: An update and discussion of the issues"*. 15<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Greensboro N.C. USA, December 14-19, 2003.

### **APPENDIX**

#### Extracts from the

## PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY (1991)

relevant to "taking" of and "harmful interference" with marine mammals and the protection of endangered, threatened, or specially protected species in the Antarctic

### **Article 3** Environmental Principles

- 1 The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, ..., shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area.
- 2 To this end:
- (a) activities in the Antarctic Treaty area shall be planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems;
- (b) activities in the Antarctic Treaty area shall be planned and conducted so as to avoid:

• • • •

- (iii) significant changes in the atmospheric, terrestrial (including aquatic), glacial or marine environments;
- (iv) detrimental changes in the distribution, abundance or productivity of species of populations of species of fauna and flora;
- (v) <u>further jeopardy to endangered or threatened species or populations of</u> such species; or
- (vi) degradation of, or substantial risk to, areas of biological, scientific, historic, aesthetic or wilderness significance;

#### Extracts from the

## PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY (1991), ANNEX II "CONSERVATION OF ANTARCTIC FAUNA AND FLORA"

### Article 1 Definitions

For the purposes of this Annex:

- (a) "native mammal" means any member of any species belonging to the Class Mammalia, indigenous to the Antarctic Treaty area or occurring there seasonally through natural migrations;
- (g) "take" or "taking" means to kill, injure, capture, handle or molest, a native mammal or bird, ...;
- (h) "harmful interference" means:
  - (ii) using vehicles or vessels, including hovercraft and small boats, in a manner that disturbs concentrations of birds and **seals**;
  - (iii) using explosives or firearms in a manner that disturbs concentrations of birds and seals; and
  - (vi) any activity that results in the <u>significant adverse modification of habitats of</u> <u>any species or population</u> of native <u>mammal</u>, bird, plant or invertebrate.

### Article 3 Protection of Native Fauna and Flora

- 1 <u>Taking or harmful interference shall be prohibited</u>, except in accordance with a permit.
- 3 The issue of such permits shall be limited so as to ensure that:
  - (a) no more native <u>mammals</u>, birds, or plants are taken than are strictly necessary to meet the purposes set forth in paragraph 2 above;

. . .

4 Any species of native <u>mammals</u>, birds and plants listed in Appendix A to this Annex shall be designated "Specially Protected Species", and shall be accorded special protection by the Parties.

## ENDANGERED, THREATENED, OR SPECIALLY PROTECTED MARINE MAMMALS OF THE ANTARCTIC (south of 60°S)

<u>Species</u>	<u>Status</u>
Blue whale (Balaenoptera musculus)	IUCN: <b>Antarctic stocks Endangered</b> (EN/D);CMS-I & CMS-II; CITES-I & CITES-II
Fin whale (Balaenoptera physalus)	IUCN: <b>Endangered</b> (EN A 1abd); CMS-I & CMS-II; CITES-I & CITES-II
Sei whale (Balaenoptera borealis)	IUCN: <b>Endangered</b> (EN A 1abd); CMS-I & CMS-II; CITES-I & CITES-II
Humpback whale (Megaptera novaeangliae)	IUCN: Vulnerable (VU A1ad); CMS-I & CMS-II; CITES-I & CITES-II
Sperm whale (Physeter macrocephalus)	IUCN: Vulnerable (VU A1bd); CMS-I & CMS-II; CITES-I & CITES-II
Southern minke whale (Balaenoptera bonaerensis)	IUCN: Lower Risk/conservation dependent (LR/cd); CMS-I & CMS-II; CITES-I & CITES-II
Arnoux's beaked whale (Berardius arnuxii)	IUCN: Lower Risk/conservation dependent (LR/cd); CMS-I & CMS-II; CITES-I & CITES-II
Southern bottlenose whale (Hyperoodon planifrons)	Lower Risk/conservation dependent (LR/cd); CMS-I & CMS-II; CITES-I & CITES-II
other <i>Ziphiidae</i> seldom occuring in waters south of 60°S, <i>e.g.</i> :	CITES-II
Scamperdown whale (Mesoplodon grayi);	
Cuvier's beaked whale ( <i>Ziphius cavirostris</i> ); Strap-toothed beaked whale ( <i>Mesoplodon layardii</i> ):	
Orca (Orcinus orca)	Lower Risk/conservation dependent (LR/cd); CMS-I & CMS-II; CITES-I & CITES-II
Longfinned pilot whale (Globicephala melas)	CITES-II
Hourglass dolphin (Lagenorhynchus cruciger)	CITES-II
Southern rightwhale dolphin ( <i>Lissodelphis</i> peronii)	CITES-II
Ross seal (Ommatophoca rossii)	specially protected under PEPAT Annex II Appendix A & CCAS
Fur seals (Arctocephalus spp.) / Antarctic fur seal (Arctocephalus gazella)	specially protected under PEPAT Annex II Appendix A & CCAS; CITES-II
Southern elephant seal (Mirounga leonina)	specially protected under CCAS; CITES-II

### LISTING CRITERIA

### IUCN Red List 2002 (http://www.redlist.org/search/search-expert.php):

- Endangered (EN/D, < 250 mature individuals);
- Endangered (EN A 1abd, an observed, estimated, inferred or suspected population size reduction of 70% over the last 10 years or three generations);
- Vulnerable (VU A1ad, an observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations);
- Vulnerable (VU A1bd, an observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations;
- Lower Risk/conservation dependent (LR/cd).

### CMS-Appendix I:

Endangered Migratory Species: species severely threatened/close to extinction  $\rightarrow$  especially and strict protection of habitats

### **CMS-Appendix II**:

Migratory Species to be the Subject of Agreements: threatened species  $\rightarrow$  protection through regional co-operation/regional conventions

### **CITES-Appendix I**:

mostly endangered species / species threatened with extinction

### **CITES-Appendix II:**

"species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival" - **includes all cetaceans** 

## Appendix A to the <u>"Protocol on Environmental Protection to the Antarctic Treaty</u> (1991), Annex II" – Specially Protected Species:

All species of the genus Arctocephalus, Fur Seals. Ommatophoca rossii, Ross Seal.

### Annex to the "Convention for the Conservation of Antarctic Seals (1972)", 2. Protected Species:

a. It is forbidden to kill or capture Ross seals *Ommatophoca rossi*, Southern elephant seals *Mirounga leonina*, or fur seals of the genus *Arctocephalus*.